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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,198	10/20/2003	Joseph D. Rainville	8540G-000213	4431

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EXAMINER	
ECHELMEYER, ALIX ELIZABETH	
ART UNIT	**PAPER NUMBER**
1795	

MAIL DATE	DELIVERY MODE
10/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/689,198	RAINVILLE ET AL.	
	Examiner	Art Unit	
	Alix Elizabeth Echelmeyer	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10,17 and 20-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10,17 and 20-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to the amendment filed July 16, 2008. Claims 10, 17, 21 and 26 have been amended. Claims 1-5, 8, 9 and 11-14 have been cancelled; claims 6, 7, 15, 16, 18 and 19 were previously cancelled. Claims 10, 17 and 20-26 are pending and are rejected for the reasons given below.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 10, 17 and 20-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what is meant by "threshold rate below 40%/s." Applicant points to paragraphs [0019] and [0020] as defining the limitation. It appears from these paragraphs that the limitation refers to 40% change in capacity of the compressor, but that is not stated in the claims nor is it clear from the claims.

For the purposes of examination, the threshold rate will be interpreted as 40% change in capacity of the compressor.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 10, 17 and 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lahiff (US 2003/0068538) in view of Arnold et al. (US 6,647,724).

Lahiff teaches a compressor for controlling oxidant to a fuel cell (abstract). The compressor is controlled by a controller ([0040]).

Lahiff teaches using electricity derived from regeneratively braking a motor in the included in the same system as the compressor to charge a storage battery ([0033]). Lahiff further teaches using the storage battery to power the compressor ([0045]).

Lahiff teaches changing the efficiency of the compressor by using valves to cut off supply of oxidant to the fuel cell when it is desired to provide less oxidant (abstract, [0050]). The output of the stack is controlled by the air that is provided by the compressor ([0030]).

With regard to claim 17, the battery, or supplemental power source, of Lahiff can be charged by electricity generated by the fuel cell ([0045]).

Lahiff fails to teach varying the speed of the compressor instead of using valves to control the output.

Arnold et al. teach a variable speed compressor used to provide air (column 4 lines 26-36). The compressor has variable speed and is driven by a motor (column 3 lines 49-65).

The compressor further comprises a controller that can switch the power to the motor from one source to another, which allows for recharging of the power source not being used (column 4 lines 59-66). With regard to claim 18, the second power source is used during intermittent bursts of power, or rapid transient modes upward, and the power source may be a capacitor or supercapacitor (column 5 line 66 - column 6 line 19).

When the compressor returns to normal operation after a burst, the capacity is inherently lower during normal operation as compared to during the burst.

It would be desirable to use the variable speed compressor system Arnold et al. to vary the amount of oxidant provided to the fuel cell of Lahiff, instead of the compressor and valve system of Lahiff, since it would reduce the need for valves in the system, thus making the system more simple. Additionally, the variable speed would reduce waste air, since only the oxidant needed by the fuel cell would be provided.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the variable speed compressor system Arnold et al. to vary the amount of oxidant provided to the fuel cell of Lahiff, instead of the compressor and valve system of Lahiff, since it would reduce the need for valves in the

system, thus making the system more simple. Additionally, the variable speed would reduce waste air, since only the oxidant needed by the fuel cell would be provided.

Lahiff in view of Arnold et al. fail to teach the claimed “threshold rate” for the compressor. Lahiff teaches that the amount of power produced by the fuel cell is influenced by the amount of air provided to the fuel cell ([0030]). In the above combination, the compressor of Arnold et al. is used to control the amount of air provided. It would have been obvious to one having ordinary skill in the art at the time the invention was made to determine rate at which air should be provided to the fuel cell of Lahiff, using the compressor of Arnold et al. to control the rate, since controlling the air controls the electrical output of the fuel cell. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05 (IIB).

Lahiff in view of Arnold et al. fail to teach that the motor used to drive the compressor is regeneratively braked to charge the battery. Lahiff does teach regenerative braking of another motor in the system, where the derived current is used to charge the battery ([0003]). One of ordinary skill in the art would recognize the advantages with using regenerative braking of a motor to charge a battery: energy that might otherwise be wasted during braking can be conserved.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to capture the braking energy from the motor used for the compressor of Lahiff in order to conserve that energy that would otherwise be lost.

Response to Arguments

6. Applicant's arguments filed July 16, 2008 have been fully considered and they are partially persuasive.

Applicant points out, on page 8 of the Remarks, that the previous Office Action did not address the limitations from former claim 19, now in claim 10, concerning regenerative braking of the compressor motor. This has been addressed in the new grounds of rejection, above.

Applicant's additional arguments were not found to be persuasive.

Concerning the arguments on pages 6-8 of the Remarks wherein Applicant states that "in the Arnold method … the compressor either [is] operation or not operating, instead of operating at two different capacities as in Applicants' method" (page 6). The examiner disagrees with this representation of Arnold et al.

Arnold et al. teach the use of stored power (Applicant's supplemental power source) for the bursts (Applicant's rapid transient mode) and then switching back to the on-line power (Applicant's main power source) for normal operation (column 6 lines 7-

20). Applicant is reminded that Arnold et al. teach a compressor *including* motor, where the compressor is powered either by a turbine or a battery (column 3 lines 10-12).

Additionally, Applicant is reminded that the instant claims do not include limitations to the constant running of either the fuel cell system or the compressor.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

Alix Elizabeth Echelmeyer
Examiner
Art Unit 1795

aee